Innovations in Transit Technology

Lester A. Hoel
University of Virginia

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What is Innovation?

- A new idea, method or device
- The introduction of something new
- Novelty
- Change
- Modernism
- Invention
- Out with the old-in with the new

Why innovation is important in transportation?

- Technological breakthroughs can result in user and societal benefits in transportation
- There are applications from industry/military advanced technology that might be transferable to transportation

Why innovation is important in transportation?

- "If we can put a man on the moon why can't we get him downtown"
- Government-private sector partnerships can advance innovative technology.

From innovation to implementation

- Innovation
- Demonstration
- Testing
- Evaluation
- Introduction into regular service

Transportation advocates and the User

- *Advocate*:
  - Fascination with technological fixes
- *User*:
  - Concerned with service characteristics

The First Wave of Transit Innovation

- 1880-1920
- Period of change and invention
- Electricity, steam power, telephone
- Railroads
- Subways
- Trolley lines

The Second Wave of Transit Innovation

- 1965-1980
- Urban Mass Transit Act of 1964
- Interest in technology was high
- Conventional transit seen as outmoded
- Manufactures were looking for new markets

New Systems Study

- 1968: Congress mandated a study to prepare a program of research, development and demonstration of “new systems of urban transportation”
- Program produced many new ideas.
- New terms developed
- Optimistic regarding potential breakthroughs

What Problem Was Being Addressed?

- Serve the needs of society
  - Transportation disadvantaged
  - Shift auto travel to transit
    - Reduce congestion
    - Save fuel
    - Control urban development and conserve land
    - Reduce travel times

What Problem Was Being Addressed?

- Overcome limitations of conventional modes
  - Poor service in low density areas
  - High cost of rail transit
  - High cost of labor

Advantages of Advanced Transit Technology

- Automation: low labor costs
- Low capacity personalized vehicles
- Lightweight guideways
- Visually acceptable aerial structures

Advantages of Advanced Transit Technology

- Ubiquitous networks for total access
- Low capital cost
- Geometrically flexible
  - steeper grades
  - sharper curves
- Electric propulsion

Tomorrow's Transportation: New Systems for the Urban Future: 1968

- Report painted a "beguiling" picture of U.S. cities after implementing "advanced transportation" technologies
- Promise: To changing the city and the quality of urban life

Tomorrow's Transportation: New Systems for the Urban Future: 1968

- Reality: Ambitious goals were not realized
- Little in the way of "new systems" exist today.

(personal rapid transit people movers, dual mode, automated guideways)

Personal Rapid Transit (PRT)

- Dulles Expo 1972. UMTA funded prototypes
  - Bendix: Dashavayer
  - Ford: Automatically Controlled Transit
  - Rohr: Monocab: Suspended guideway
  - Otis Elevator: Air cushion suspension and LIM.
- Commercial interest declined with lack of funds

Innovative Transit Technology
What have we learned?

- The Transit Act spawned new ideas
- Strong proponents emerged
- Optimism lead to realism
- Conventional transit advocates fought back

Innovative Transit Technology
What have we learned?

- Institutional problems emerged
  - Integrating new systems and existing land use
  - How to finance costly systems
  - Demand expectations were not met.
- A niche market: the pedestrian
- Para-Transit proved viable

Today's Transit Technologies
Fixed: Urban Systems

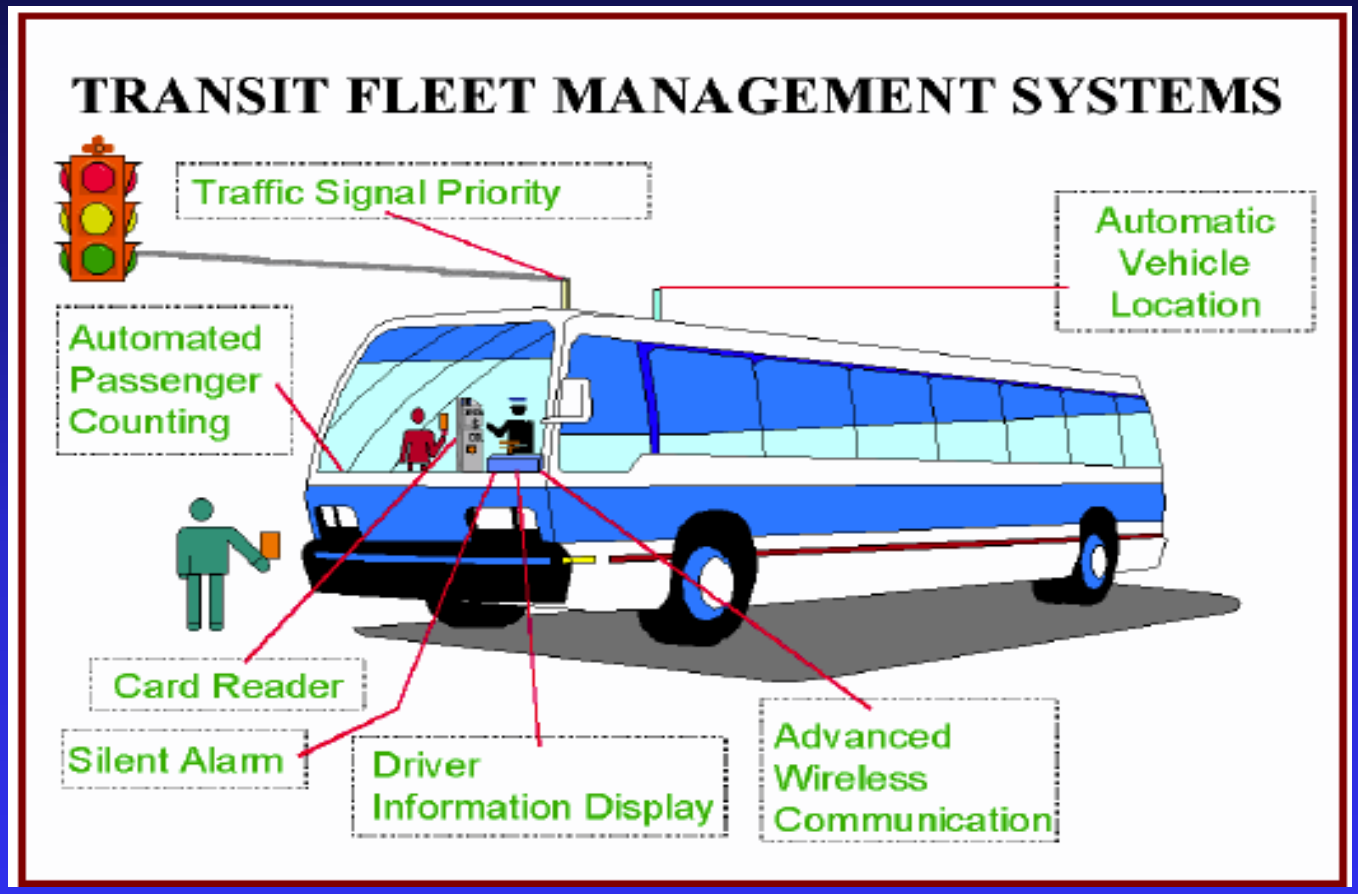
- Bus transit
- Light Rail
- Rail rapid transit
- Automated transit
- Commuter rail

Today's Transit Technologies
Flexible: Para-Transit

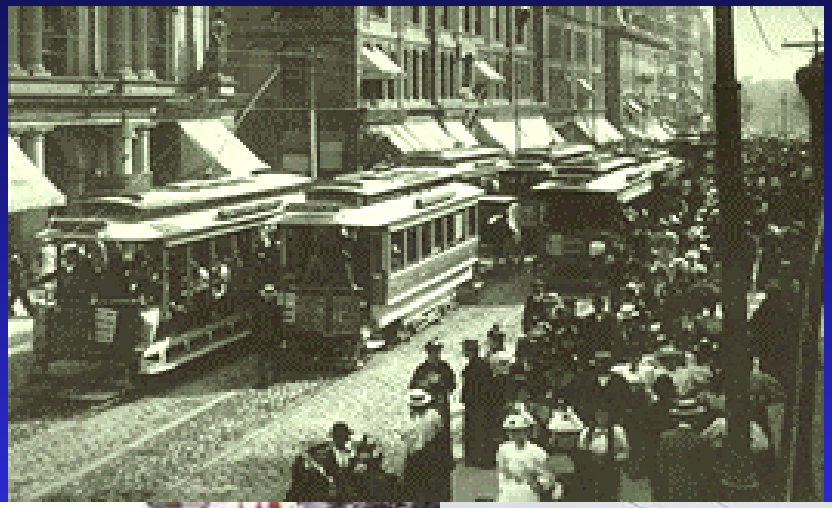
- Carpools
- Dial-A-Ride
- Taxicab
- Jitney
- Vanpools

Buses: Transit's Workhorse

Bus Transit: Incorporating ITS



Light Rail: A 19th Century Technology Repackaged for the 21st Century



Rail Transit: A Big City Solution

Personal Rapid Transit
A Space-Age Solution

Monorail: A Futuristic Solution (*It always was and it always will be*)

Para-Transit as a Specialized Service

Taxis: A Ubiquitous Para-Transit Mode

Riding Public

- Choice Rider
  - Cost
  - Time
  - Parking
  - Reliability
  - Security/Safety
  - Level of service
- Captive Rider
  - Dependent on the system

Role of Transit

- Respond to local decision making
- Strengthen the CBD in large cities
- Serve as a backup system
- Provide mobility for the carless
- Conserve energy and space
- Serve special urban and rural groups

Challenge to the Transportation Profession

To plan, design and operate systems of transportation that achieve the highest level of service consistent with available resources

Introduce innovation from the perspective of the user